

## RWVL Meeting with the ANR on 4.27.22

### Questions asked by the ANR with RWVL Member Answers

**1a) Oliver Pierson (Manager of Lakes and Ponds Division, VT DEC):** *In my understanding the VT statutes as they are impacted by wake boats, I can see the connection between boat design and how it can influence phosphorus and suspension of sediment. I ask if there is more specific research on this to determine the level of severity and how this issue is inconsistent with Vermont's legal framework/statutes, e.g., in the VT Water Quality Standards. Could you address this with specific details?*

#### Response from RWVL member Dan Sharpe:

*How Unmanaged Wake Boats in Vermont Violate Environmental Protection Rules Under the Vermont Water Quality Standards*

The [Vermont Water Quality Standards](#) and the related Environmental Protection Rules, Chapter 29A, establish the criteria under which the Department of Environmental Conservation is to manage Vermont's public waters. These rules, in Section 29A-104(b), state that "All waters of the State shall be managed to support their designated and existing uses" (*emphasis added*). Designated uses include the use of waters for boating and related recreational uses.

The comprehensive [Vermont Use of Public Waters Rules](#) include the underlying policies for the management of boating and include management rules for maximum speeds and other operational requirements, use of personal watercraft, and use of internal combustion engines. As provided in Section 29A-105(a), "All waters shall be managed in accordance with these rules to protect, maintain, and improve water quality" (*emphasis added*).

As demonstrated in our [RWVL ANR Petition](#), the introduction of wake boats in Vermont has presented a unique and new challenge to the management of public waters because of the impact of significantly enhanced wakes that have not been seen previously in our public waters.

If wake boats and their enhanced wakes are permitted to operate in public waters with no management rules whatsoever or under existing rules developed to address the conventional power boats that have been used in Vermont waters for decades, the impact on aquatic biota and wildlife, shoreline habitats, other normal uses (including recreation and fishing), public safety, and the management and control of aquatic invasive species will be adversely impacted. Unmanaged wake boats in Vermont waters will degrade and worsen water quality, thus violating the policy standards established in the [Vermont Environmental Protection Rules](#). Unmanaged wake boat use and operation will diminish, rather than maintain, the levels of water quality in public waters. The absence of management rules for wake boats under the Environmental Protection Rules fails to protect public waters and fails to meet the policy standards established for these rules.

It is understandable that existing [Vermont Use of Public Waters Rules](#) do not contemplate the presence or operation of wake boats and enhanced power boat wakes in Vermont. These watercraft did not exist in Vermont until recently. Their impact on the environment, existing normal public uses, aquatic habitat, public safety, and the spread of aquatic invasive species were not known or brought to the attention of the Department.

Recent attention to the issue of enhanced power boat wakes and enhanced wake sports in Vermont and around the country have brought public awareness to this issue and the need for reasonable management rules that are necessary to protect, maintain, and hopefully improve our public waters. Action now by the DEC to adopt reasonable management rules for wake boats will address the obligations under the Vermont Water Quality Standards.

*[Note: Oliver's other question included in Question 1a is answered in Question 1b.]*

**1b) Oliver Pierson responded back on this same issue in an email the next day as follows:**

*"One point I wanted to follow up on. Both the presentation and the petition mention the "Incompatibility of unmanaged wakesporting with Vermont's Water Quality Standards," but I think you can reinforce this point a bit in future presentations. As you all know, phosphorus is a big issue in Vermont lakes, and table 3 of the VT WQS provides numeric nutrient criteria that our lakes must meet, or they can be deemed impaired. These criteria are based principally on phosphorus concentrations and related nutrient response conditions (clarity, chlorophyll a). If the research on wake boats shows, as your petition suggests, that wakes can lead to shoreline erosion and disturbance of lake bottom sediment, these two impacts can increase phosphorus concentrations and create a scenario where wake boat usage is contributing to lakes no longer complying with the VT WQS.*

**Response from RWVL member Dave Johnson:**

*Lack of Specific Research Connecting Boat Design and How It Can Influence Phosphorus and Suspension of Sediment*

RWVL has not yet identified wake boat-specific studies designed to directly assess the impact of wake boat activity on total phosphorus concentrations in a lake environment. However, given what is known about nutrient loading in Vermont Lakes, we are confident that the enhanced waves and powerful slipstreams produced by wake boat propellers, engaged in wake sports in locations too close to shore or in water that is too shallow, contribute *much more* than traditional motorboats engaged in traditional water activities in these locations. .

At the current shoreline safety zone distance of 200 ft, according to the recent University of Minnesota St. Anthony Falls Laboratory (SAFL) Wake Boat Wave Study ([2022](#)), waves from wake surfing reach the shore with 3-9 times the total wave energy and 6-12 times the peak wave power compared with traditional ski boats. Shoreline erosion and near shore sediment re-suspension are threshold phenomena, responding to peaks in the driving parameters. The UMN findings indicate that the energy and power in the waves from wake sports in inappropriate locations will trigger significantly increased rates of shoreline erosion and near shore sediment re-suspension.

Other studies (Ray ([2020](#)) and Raymond and Galvez-Cloutier ([2015](#))) indicate that the propeller slipstream resulting from wake surfing penetrates much deeper than that from traditional motorboat activities.

There are many studies demonstrating that large boat waves cause shoreline erosion and near shore turbidity (Mercier-Blais and Prairie ([2014](#)), Johnson ([1994](#)), Cox and Macfarlane ([2019](#)), Bilkovic et al. ([2017](#))). Other studies indicate that the propeller slipstreams from wake sports are much more likely to re-suspend fine sediments than traditional motorboats, leading again to increased turbidity Ray ([2020](#)), and Raymond and Galvez-Cloutier ([2015](#))). Some of these studies correlate increased turbidity with increased total phosphorus (Anthony and Downing ([2009](#)), Yousef ([1980](#))).

Much of the money being spent in Vermont to reduce nutrient loading is aimed at reducing sediment loading due to stormwater runoff and shoreline erosion. This is the motivation for the [Shoreland Protection Act](#) and major parts of the [Clean Water Initiative](#) and the [Municipal Roads General Permit](#) and [Better Roads](#) Programs. These programs recognize the role that sediment transport plays in nutrient loading, and the need to reduce this transport to meet the total maximum daily load (TMDL) targets. Accordingly, our RWVL group is surprised and dismayed that lake uses that clearly result in significant increases sediment loading and sediment re-suspension continue to be unregulated.

**3) Oliver Pierson (DEC):** *Was justification for increasing the current minimum of 30 contiguous acres to 60 acres as being required to operate wake boats? Was this based on science or was this a judgment call, i.e., where does the 60-contiguous acre minimum come from?*

**Response from RWVL member Jack Widness:**

Yes, it was a judgment call that we based on points included in our [ANR petition](#):

- To provide wake boats with an adequate area for “ride durations” or straight line wake sporting runs, as detailed in Figure 12 (*Petition pg 31*).
- To provide an area that allows for the enjoyment and safety of other traditional recreational activities competing for the uses within and outside of the Wake Sport Zone (*Petition pg 33*).
- To take into account multiple wake boats operating in the Wake Sport Zone where the height and power of wakes are additive, increasing the chance of personal injury (*Petition pg 33*).
- To simplify the identification of an area of 60-contiguous acres due to its larger size, which will help with compliance and enforcement (*Petition pg 34*).

**4) Hannah Smith (DEC Lawyer):** *How will wake boats operate between the 200 ft shore land safety zone (per the [Vermont Use of Public Water Rules](#)) in getting to the 1000 ft wake sport zone line where they can operate in enhanced wake mode?*

**Response from RWVL member Dan Sharpe:**

- No enhanced wakes will be allowed until wake boats reach the Wake Sport Zone.
- Furthermore, wake boats operating anywhere outside a Wake Sport Zone will be subject to the same “no wake rule” applicable to all powered watercraft in Vermont.

**5) Oliver Pierson (DEC):** *How influential was the University Minnesota wake boat study in your decision to request a 1000 ft distance from shore as the Wake Sport Zone?*

**Response from RWVL member Dave Johnson:**

The University of Minnesota St. Anthony Falls Laboratory (SAFL) Wake Boat Wave Study ([2022](#)) was given high priority because of the longer distances from shore that this study included in comparison to other studies, i.e., up to 625 ft from shore (*Petition Table 3 page 15*).

**Response from RWVL member Meg Handler:**

Any rule establishing a distance from shore for the operation of wake boats should consider future expectations of wake boats development. As detailed in our petition, larger, more powerful wake boats capable of generating ever greater sized enhanced wakes have been observed, and this evolution is expected to continue into the future (*Petition pg 7 to 9, and pg 19 Figure 6*). Thus, there is a need to plan ahead for the next 5 to 10 years in establishing the distance from shore as researchers gather new data regarding the potential adverse impacts on water quality (including the transport of AIS) (*Petition pg 35 to 40*), shoreline erosion (*Petition pg 13 to 24*), and lake bottom scouring (*Petition pg 25 to 30*).

**Response from RWVL member Dan Sharpe:**

Because of its high priority, we intentionally waited for the SAFL Wake Boat Wave Study before filing our ANR petition. We did so because we knew that the SAFL Study was undergoing rigorous peer review, i.e. unlike the two boating industry studies: Goudey and Girod (2015); and Fay, Gunderson, and Anderson (2022). It was our desire to base our recommendations on sound, scientific evidence and avoided bias.

**Response from RWVL member Jack Widness:**

Although the study did not include distances beyond 625 feet from shore, in our petition includes modeling done using data and formulas included in the SAFL Study. This modeling demonstrated that the enhanced wake impacts extend out to 1000 ft from shore and beyond (*ARN petition Table 4 page 17*).

Furthermore, our petition includes an study of shoreline turbulence performed by investigators at the University of Quebec at Montreal. The wake boats used in this [2014 Canadian study](#) were less powerful than those used today. These investigators reported that compared to wind waves that wake boats generated turbulence at distances of approximately 1000 ft from shore (*ARN petition page 18*).

- 6) **Oliver Pierson (DEC):** *Do we have a sense for the pervasiveness of the use of wake boats in VT? And do we know if this is a growing segment of the boating industry elsewhere is likely to grow in VT?*

**Response from RWVL member Jack Widness:**

- ANR petition Table 2 (pg 11) addresses this with *estimates* in 2021 from 14 lakes where RWVL members live here we document that: 1) <2% of camps/homes have wake boats; and 2) ~0.5% of all watercraft owned by home owners own a wake boat. These estimates do not include boats entering at state and private boat launches.

**Response from RWVL member Mark Milazzo:**

- Relative to other states such as those in the West, Midwest and South, Vermont does not have the same degree intensity of wake boat numbers and their adverse impacts. These other boating communities are likely examples of what we can expect in the future for Vermont if there is no appropriate active management of these boats.